L Numb r	Hits	Search Text	DB	Time stamp
-	193	(73/592).CCLS.	USPAT; US-PGPUB	2003/01/09 11:45
-	23	("2753948" | "3089333" | "3365935" | "3675053" | "4038866" | "4041775" | "4408285" | "4520674" | "4562740" | "4612620" | "4655082" | "4755953" | "4771637" | "4823600" | "4827771" | "5058434" | "5103675" | "5379643" | "5381692" | "5557969" | "5697450" | "5955670" | "6079275").PN.	USPAT	2003/01/03 18:28
-	0	6234021.URPN.	USPAT	2003/01/03 18:33
-	214	(73/593).CCLS.	USPAT; US-PGPUB	2003/01/09 12:33
-	104	((73/593).CCLS.) and transmit$4	USPAT; US-PGPUB	2003/01/08 17:24
-	648	(73/597).CCLS.	USPAT; US-PGPUB	2003/01/09 12:07
-	511	((73/597).CCLS.) and transmit$4	USPAT; US-PGPUB	2003/01/08 17:26
-	173	(73/659).CCLS.	USPAT; US-PGPUB	2003/01/08 17:25
-	148	(73/661).CCLS.	USPAT; US-PGPUB	2003/01/08 17:25
-	166	(73/658).CCLS.	USPAT; US-PGPUB	2003/01/08 17:25
-	168	(73/649).CCLS.	USPAT; US-PGPUB	2003/01/08 17:25
-	260	(73/587).CCLS.	USPAT; US-PGPUB	2003/01/08 17:25
-	63	((73/649).CCLS.) and transmit$4	USPAT; US-PGPUB	2003/01/08 17:40
-	53	((73/658).CCLS.) and transmit$4	USPAT; US-PGPUB	2003/01/08 17:48
-	53	((73/661).CCLS.) and transmit$4	USPAT; US-PGPUB	2003/01/08 17:55
-	52	((73/659).CCLS.) and transmit$4	USPAT; US-PGPUB	2003/01/08 18:01
-	163	((73/587).CCLS.) and transmit$4	USPAT; US-PGPUB	2003/01/08 18:14
-	207	((73/660).CCLS.) and transmit$4	USPAT; US-PGPUB	2003/01/08 18:45
-	132	(polar adj co$1ordinate) same sensor	USPAT; US-PGPUB	2003/01/08 18:55
-	281651	(polar adj co$1ordinate) same vibrat$3 or noise	USPAT; US-PGPUB	2003/01/08 18:56
-	2	(polar adj co$1ordinate) same vibrat$3 same noise	USPAT; US-PGPUB	2003/01/08 18:56
-	74100	(accelerometer or transduc r r transmitter or transceiver or receiver or (strain near3 (gauge or gage))) same (radio r rem te)	USPAT; US-PGPUB	2003/01/09 12:03

-	214	(73/593).CCLS.	USPAT; US-PGPUB	2003/01/09 12:33
-	13	((accelerometer r transducer or transmitter or transceiver r receiver or (strain near3 (gauge or gage))) same (radi or remote)) and ((73/593).CCLS.)	USPAT; US-PGPUB	2003/01/09 12:34
-	1	accelerometer near3 (radio adj transmitter)	USPAT; US-PGPUB	2003/01/10 10:48
-	27	accelerometer near2 transmitter	USPAT; US-PGPUB	2003/01/10 10:49
-	43	accelerometer near3 transmitter	USPAT; US-PGPUB	2003/01/10 11:07
-	499	(73/660).CCLS.	USPAT; US-PGPUB	2003/01/10 11:34
-	4	("4885707" | "5390545" | "5792956" | "6078874").PN.	USPAT	2003/01/10 13:17
-	0	6276213.URPN.	USPAT	2003/01/10 11:57
-	20	("3955419" | "4366544" | "4608532" | "5005142" | "5109700" | "5162725" | "5347476" | "5365462" | "5375073" | "5377128" | "5510606" | "5633811" | "5710815" | "5726911" | "5805474" | "5831261" | "5841121" | "5852351" | "5870699" | "5895857").PN.	USPAT	2003/01/10 11:57
-	3	6078874.URPN.	USPAT	2003/01/10 12:01
-	1	("4237454").PN.	USPAT; US-PGPUB	2003/01/10 18:50
-	0	("ore adj feed").PN.	USPAT; US-PGPUB	2003/01/10 18:51
-	405	ore adj feed	USPAT; US-PGPUB	2003/01/10 18:52
-	0	(ore adj feed) same (fill adj level)	USPAT; US-PGPUB	2003/01/10 19:01
-	0	(ore adj feed) and (fill adj level)	USPAT; US-PGPUB	2003/01/10 18:53
-	281	ore adj feed	EPO; JPO; DERWENT	2003/01/10 18:53
-	1	(ore adj feed) and (fill adj level)	EPO; JPO; DERWENT	2003/01/10 18:54
-	0	444556.URPN.	USPAT	2003/01/10 19:12
-	59	mill$3 near2 noise	USPAT; US-PGPUB	2003/01/10 19:32
-	49	mill same (fill$3 adj level)	USPAT; US-PGPUB	2003/01/10 19:33
-	32	mill same (fill$3 adj level)	EPO; JP ; DERWENT	2003/01/10 19:42

C:\APPS\east\workspaces\10019307.wsp

	U	1	Document ID	Issue Date	Pages
1	☐	☒	US 20020083773 A1	20020704	24
2	☐	☒	US 6484582 B2	20021126	13
3	☐	☒	US 6321602 B1	20011127	23
4	☐	☒	US 6257065 B1	20010710	7
5	☐	☒	US 6223602 B1	20010501	5
6	☐	☒	US 6192759 B1	20010227	28

3771356

6076405
6014896
33

	Title	Current OR	Current XRef
1	Condition based monitoring by vibrational analysis	73/660	
2	Rolling bearing with sensing unit which can be remotely interrogated	73/593	384/448; 384/535
3	Condition based monitoring by vibrational analysis	73/660	340/679; 702/182; 702/35; 73/593
4	Strain gauge vibration sensor	73/654	73/514.33; 73/514.37; 73/660
5	Electromagnetic vibration sensor	73/660	73/597; 73/643; 73/655; 73/657; 73/661
6	Remote self-powered structure monitor	73/583	

DERWENT-ACC-NO: 1975-50450W
DERWENT-WEEK: 197530
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TITLE: Ball mill filling control system - end point regulator reduces target
for comparison and subsequent post-interim increase

PATENT-ASSIGNEE: CONS MAT AUTOM IND[CSMAR]

PRIORITY-DATA: 1972SU-1830928 (October 25, 1972)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
SU 444556 A	November 20, 1974	N/A	000	N/A

INT-CL (IPC): B02C025/00

ABSTRACTED-PUB-NO: SU 444556A
BASIC-ABSTRACT: Ball-mill filling control system, for use in the cement ind.,
varies the feed rate to suit fill levels, working off an end-point regulator
whose function it is to maximise throughput, taking the flow-through or
transient processes in the mill into consideration in arriving at this.
Changes in grindability can lead to mill clogging and therefore after each step
completed by the regulator towards reducing the target values in terms of fill
level and increase in this by a permitted amt., there is an increased step
(regulation) in the same reducing sense and only once the transient or
change-over period (interim) has elapsed is a step taken towards increasing the
target (ideal) value. This ensures that the mill keeps operating, and by
avoiding clogging the method ensures max. throughput.

TITLE-TERMS:
BALL MILL FILL CONTROL SYSTEM END POINT REGULATE REDUCE TARGET
COMPARE
SUBSEQUENT POST INTERIM INCREASE

DERWENT-CLASS: L02 P41

CPI-CODES: L02-C02;

TITLE: Ball mill automatic fine grinding control appts. - has outputs from power consumption and material throughput sensors to divider connected to extremal regulator

INVENTOR: GUTERMAN, E J; ROGOZINA, O I ; SAVIN, A A

PATENT-ASSIGNEE: CONS MAT WKS AUTOM[CSMAR]

PRIORITY-DATA: 1979SU-2801350 (July 24, 1979)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
SU 845847 B	July 17, 1981	N/A	004	N/A

INT-CL (IPC): B02C025/00

ABSTRACTED-PUB-NO: SU 845847B

BASIC-ABSTRACT: Automatic grinding control appts. for a ball mill (1) and contg. fineness of grinding (2) and mill fill level (3) sensors, raw material flow rate regulator (4) and a surfactant concn. setter (13) has lower specific power consumption for fine grinding in e.g. the cement and ore-concentration industries. Power consumption (9) and mill throughput (10) sensors are introduced along with divider (11) and an external regulator (12) for the surfactant concn.

Control is now optimised from the point of view of min. specific power consumption. The degree of grinding of the end-product is set (5) and the raw material flow is regulated (6). Any increase of throughput is sensed for the divider which calculates specific power consumption as the ratio of the power and throughput signals.

Since most power is consumed in movement of the balls in the mill, the power consumption does not rise as much as the throughput of raw material. As the ratio decreases, the surfactant concn. extremal regulator operates to increase the surfactant inflow. The extremal regulator maintains a search for the optimum surfactant concn. as other factors vary. Bul.26/15.7.81

CHOSEN-DRAWING: Dwg.1

TITLE-TERMS:

DERWENT-ACC-NO: 1980-D5692C
DERWENT-WEEK: 198016
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TITLE: Ore feed regulation for ball mill - by measuring fill level at start
and end of mill to calculate time relation between signals to vary feed

INVENTOR: DLIMBETOV, B K; GRINMAN, I G ; ORDABAEV, B B

PATENT-ASSIGNEE: AS KAZA METAL ENRIC[AKMER]

PRIORITY-DATA: 1977SU-2489604 (May 26, 1977)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
SU 679243 A	August 15, 1979	N/A	000	N/A

INT-CL (IPC): B02C025/00   need translation

ABSTRACTED-PUB-NO: SU 679243A
BASIC-ABSTRACT: Earlier method measures acoustic distrubance at the start of
the mill to calculate the fill level H1 and vary the ore feed accordingly. For
greater accuracy, the measurement is repeated to calculate the fill level H2 at
the end of the mill, and the time relation between the H1 and H2 signals is
used to vary the feed according to the H1 level and the speed V of the material
along the mill. Information is now obtained about the degree of filling along
the mill and this is instrumental in stabilisation of grinding in all
cross-sections. Variation in ore size and hardness alters the circulating load
and dwell-time in the mill. In turn this influences the parameter V. By
knowing V, the circulating load is definable to serve as a criterion of mill
operating conditions. The signals from the electro-acoustic sensors (3, 4) on
the mill (1) come to analysers (5, 6) for calculators (7-9), control (10) and
ore feed (11). The mill is connected to a classifier (2).

TITLE-TERMS:
ORE FEED REGULATE BALL MILL MEASURE FILL LEVEL START END MILL
CALCULATE TIME
RELATED SIGNAL VARY FEED

DERWENT-CLASS: P41

DERWENT-ACC-NO: 1983-808317
DERWENT-WEEK: 198345
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TITLE: Electroacoustic filling level monitor for mill - includes cross
compensation for noise interference between adjacent milling devices

INVENTOR: REINHARD, A; REINHARDT, E ; SCHORCHT, C J

PATENT-ASSIGNEE: FRIES G[FRIEI]

PRIORITY-DATA: 1981DD-0235367 (December 3, 1981)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DD 201253 A	July 13, 1983	N/A	010	N/A

INT-CL (IPC): B02C025/00; G05D009/12

ABSTRACTED-PUB-NO: DD 201253A
BASIC-ABSTRACT: The level monitor uses the noise provided by milling to
determine the level of the material contained within the mill, for load
regulation. The milling noise is measured as an analogue signal provided by a
measuring transducer (7,8) which is coupled to an amplifier (9,10). The input
of the latter is coupled to earth via a load resistance (11,12) the output of
the amplifier associated with the milling device (2) providing interference
noise fed to a control input of the measuring transducer (7) for the adjacent
milling device (3) subjected to the interference.

The cross compensation between the different milling devices prevents errors in
the filling level measurement due to background noise.

CHOSEN-DRAWING: Dwg.1/1

TITLE-TERMS:
ELECTROACOUSTIC FILL LEVEL MONITOR MILL CROSS COMPENSATE NOISE
INTERFERENCE
ADJACENT MILL DEVICE

DERWENT-CLASS: P41 S02 T06 X25

EPI-CODES: S02-C06D; T06-B05; T06-D07; X25-A03C;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N1983-197759

DERWENT-ACC-NO: 1986-176607
DERWENT-WEEK: 198628
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TITLE: Automatic detector for mill filling level - NoAbstract

PATENT-ASSIGNEE: LEVIN G I[LEVII]

PRIORITY-DATA: 1983CS-0005580 (July 26, 1983)

PATENT-FAMILY:
PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
CS 8305580 A	May 15, 1986	N/A	008	N/A

INT-CL (IPC): B02C025/00
ABSTRACTED-PUB-NO:
EQUIVALENT-ABSTRACTS:

TITLE-TERMS:
AUTOMATIC DETECT MILL FILL LEVEL NOABSTRACT

DERWENT-CLASS: P41

PAT-NO: WO000062935A1

DOCUMENT-IDENTIFIER: WO 62935 A1

TITLE: METHOD FOR VERIFYING THE FILLING LEVEL OF COAL IN A BALL MILL

PUBN-DATE: October 26, 2000

INVENTOR-INFORMATION:
NAME	COUNTRY
FONTANILLE, DANIEL	FR
BARBOT, JACQUES	FR

ASSIGNEE-INFORMATION:
NAME	COUNTRY
ALSTOM	FR
FONTANILLE DANIEL	FR
BARBOT JACQUES	FR

APPL-NO: FR00000880

APPL-DATE: April 7, 2000

PRIORITY-DATA: FR09904737A (April 15, 1999)

INT-CL (IPC): B02C017/18;B02C025/00

EUR-CL (EPC): B02C017/18 ; B02C025/00

ABSTRACT:

CHG DATE=20001202 STATUS=O>The method for verifying the filling level in a ball mill fed by material which is to be ground and provided with a rotationally mounted drum on two distant bearings consists in measuring the weight of the drum with the aid of bondage-gage weighing sensors (11-16) disposed underneath the bearings supporting the drum of the mill and in comparing the measured weight with a set value that is pre-established with a view to regulating the supply of material which is to be ground to said mill. According to the inventive method, the weight measured by a first weight value (FV) representing the vertical component of the effort created by the rotational driving torque of the drum is corrected before the comparison step.

DERWENT-ACC-NO: 2001-031606
DERWENT-WEEK: 200253
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TITLE: Method for checking filling level of coal in ball mill involves
correction of weight measured by value of vertical component of effort created
by driving torque of drum before comparison step

INVENTOR: BARBOT, J; FONTANILLE, D

PATENT-ASSIGNEE: ALSTOM[ALSM], ALSTOM SA[ALSM]

PRIORITY-DATA: 1999FR-0004737 (April 15, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200062935	October 26, 2000	F	021	B02C 017/18
~~AT~~	May 8, 2002	N/A	000	B02C 017/18
CN 1348398 A	October 20, 2000	N/A	000	B02C 025/00
FR 2792224 A1	November 2, 2000	N/A	000	B02C 017/18
AU 200038256 A	January 23, 2002	F	000	B02C 017/18
EP 1173280 A1	February 13, 2002	N/A	000	B02C 017/18
CZ 200103710 A3				

DESIGNATED-STATES: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CZ
DE DK DM EE E
S FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KR KZ LC LK LR LS LT LU LV
MA MD
MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA
UG US UZ VN
YU ZA ZW AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC
MW NL OA P
T SD SE SL SZ TZ UG ZW AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL
PT SE

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
WO	N/A	2000WO-FR00880	April 7, 2000
200062935A1	N/A	2000CN-0806235	April 7, 2000
CN 1348398A	N/A	1999FR-0004737	April 15, 1999
FR 2792224A1	N/A	2000AU-0038256	April 7, 2000
AU 200038256A	Based on	WO 200062935	N/A

Coal 24

First weight value FV

CHOSEN-DRAWING: Dwg.1/7

TITLE-TERMS:
METHOD CHECK FILL LEVEL COAL BALL MILL CORRECT WEIGHT MEASURE
VALUE VERTICAL
COMPONENT EFFORT DRIVE TORQUE DRUM COMPARE STEP

DERWENT-CLASS: P41 S02 X25

EPI-CODES: S02-C06B; S02-C07; X25-J;

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N2001-024783

INT-CL (IPC): B02C017/18; B02C025/00 ; F23K001/00

ABSTRACTED-PUB-NO: WO 200062935A
BASIC-ABSTRACT: NOVELTY - Method involves drum rotationally mounted on two distant bearings, and series of bondage-gage weight sensors (11 to 16) placed under bearings. Sensors send electric signals representing weight of drum with load. Signals are sent to calculation unit (19) producing electric signal (P).

DETAILED DESCRIPTION - Before being compared with data base (20) pre-established in comparator (21) with exit linked to conventional regulator (22) regulating coal feeder (23) to mill, weight measured by first weight value (FV) representing vertical component of effort created by rotational driving torque of drum is corrected. Exit signal from comparator regulates working speed of feeder, hence regulates coal (24) flow of mill. An INDEPENDENT CLAIM is also included for the apparatus to verify filling level of coal.

USE - For verifying filling level of coal in a ball mill.

ADVANTAGE - Method is very reliable, and is independent of quality and granulometry of coal. Method takes account of wear and tear of balls, and of renewing of balls in mill.

DESCRIPTION OF DRAWING(S) - The drawing illustrates schematically verifying method.

Bondage-gage weight sensors 11 to 16

Calculation unit 19

Data base 20

Comparator 21

Conventional regulator 22

Coal feeder 23